No. 200500055

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Arkansas Agricultural Experiment Station

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSES, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

RICE

'Medark'

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the* Plant Variety Protection Office *to be affixed at the City of Washington, D.C. this twenty-seventh day of April, in the year two thousand and five.*

Attest:

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary of Agriculture

REPRODUCE LOCALLY. *Include form number and date on all reproductions* — Form Approved - OMB No. 0581-0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE
(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF OWNER
Arkansas Agricultural Experiment Station

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME
RU0001151

3. VARIETY NAME
Medark

4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)*
Agricultural Food and Life Sciences Building
Room E108
University of Arkansas
Fayetteville, AR 72701

5. TELEPHONE *(include area code)*
(479) 575-6884

6. FAX *(include area code)*
(479) 575-8646

FOR OFFICIAL USE ONLY

PVPO NUMBER
200500055

FILING DATE
1/7/05

7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION *(corporation, partnership, association, etc.)*
Land Grant University

8. IF INCORPORATED, GIVE STATE OF INCORPORATION

9. DATE OF INCORPORATION

10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. *(First person listed will receive all papers)*
Don Dombek, Director
Arkansas Crop Variety Improvement Program
1091 W. Cassatt Street
Fayetteville, AR 72704

FEES RECEIVED

FILING AND EXAMINATION FEES:
$ 3652 –
DATE 1/7/05

CERTIFICATION FEE:
$ 432.00
DATE 4-5-05

11. TELEPHONE *(Include area code)*
(479) 575-6884

12. FAX *(Include area code)*
(479) 575-8646

13. E-MAIL
ddombek@uark.edu

14. CROP KIND *(Common Name)*
Rice

16. FAMILY NAME *(Botanical)*
Poaceae

15. GENUS AND SPECIES NAME OF CROP
Oryza sativa L.

17. IS THE VARIETY A FIRST GENERATION HYBRID?
☐ YES ☑ NO

18. DOES THE VARIETY CONTAIN ANY TRANSGENES? (*OPTIONAL*)
☐ YES ☑ NO
IF SO, PLEASE GIVE THE ASSIGNED USDA-APHIS REFERENCE NUMBER FOR THE APPROVED PETITION TO DEREGULATE THE GENETICALLY MODIFIED PLANT FOR COMMERICALIZATION. _____

19. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED
(Follow instructions on reverse)

a. ☑ Exhibit A. Origin and Breeding History of the Variety
b. ☑ Exhibit B. Statement of Distinctness
c. ☑ Exhibit C. Objective Description of Variety
d. ☑ Exhibit D. Additional Description of the Variety *(Optional)*
e. ☑ Exhibit E. Statement of the Basis of the Owner's Ownership
f. ☑ Voucher Sample *(2,500 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository)*
g. ☑ Filing and Examination Fee ($3,652), made payable to "Treasurer of the United States" *(Mail to the Plant Variety Protection Office)*

20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS OF CERTIFIED SEED? *(See Section 83(a) of the Plant Variety Protection Act)*
☐ YES *(If "yes", answer items 21 and 22 below)* ☑ NO *(If "no", go to item 23)*

21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES?
☐ YES ☐ NO
IF YES, WHICH CLASSES? ☐ FOUNDATION ☐ REGISTERED ☐ CERTIFIED

22. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?
☐ YES ☐ NO
IF YES, SPECIFY THE NUMBER 1,2,3, etc. FOR EACH CLASS.
☐ FOUNDATION ☐ REGISTERED ☐ CERTIFIED
(If additional explanation is necessary, please use the space indicated on the reverse.)

23. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES?
☑ YES ☐ NO
IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. *(Please use space indicated on reverse.)*

24. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT *(PLANT BREEDER'S RIGHT OR PATENT)*?
☐ YES ☑ NO
IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. *(Please use space indicated on reverse.)*

25. The owners declare that a viable sample of basic seed of the variety has been furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate.

The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Owner(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF OWNER		SIGNATURE OF OWNER	
NAME *(Please print or type)* G. WEIDEMANN		NAME *(Please print or type)*	
CAPACITY OR TITLE DEAN	DATE 12/20/04	CAPACITY OR TITLE	DATE

(See reverse for instructions and information collection burden statement)

ST-470 (04-03) designed by the Plant Variety Protection Office using Word 2002.

1

INSTRUCTIONS

2005000055

GENERAL: To be effectively filed with the Plant Variety Protection Office (PVPO), **ALL** of the following items must be **received** in the PVPO: (1) Completed application form signed by the owner; (2) completed exhibits A, B, C, E; (3) for a seed reproduced variety at least 2,500 viable untreated seeds, for a hybrid variety at least 2,500 untreated seeds of each line necessary to **reproduce** the variety, or for tuber reproduced varieties verification that a viable *(in the sense that it will reproduce an entire plant)* tissue culture will be deposited and maintained in an approved public repository; (4) check drawn on a U.S. bank for $3,652 ($432 filing fee and $3,220 examination fee), payable to "Treasurer of the United States" *(See Section 97.6 of the Regulations and Rules of Practice.)* Partial applications will be held in the PVPO for not more than 90 days, then returned to the applicant as unfiled. Mail application and other requirements to Plant Variety Protection Office, AMS, USDA, Room 401, NAL Building, 10301 Baltimore Avenue, Beltsville, MD 20705-2351. Retain one copy for your files. All items on the face of the application are self explanatory unless noted below. Corrections on the application form and exhibits must be initialed and dated. **DO NOT** use masking materials to make corrections. If a certificate is allowed, you will be requested to send a check payable to "Treasurer of the United States" in the amount of $432 for issuance of the certificate. Certificates will be issued to owner, not licensee or agent.

Plant Variety Protection Office
Telephone: (301) 504-5518
FAX: (301) 504-5291
Homepage: http://www.ams.usda.gov/science/pvpo/pvpindex.htm

To avoid conflict with other variety names in use, the applicant must check the appropriate recognized authority and provide evidence that name has been cleared by the appropriate recognized authority before the Certificate of Protection is issued. For example, for agricultural and vegetable crops, contact: Seed Branch, AMS, USDA, 10301 Baltimore Avenue, Suite 401 NAL Building, Beltsville, MD 20705. Telephone: (301) 504-5682 http://www.ams.usda.gov/lsg/seed.htm.

ITEM

19a. Give: (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method;
(2) the details of subsequent stages of selection and multiplication;
(3) evidence of uniformity and stability; and
(4) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified

19b. Give a summary of the variety's distinctness. Clearly state how this application variety may be distinguished from all other varieties in the same crop. If the new variety is most similar to one variety or a group of related varieties:

(1) identify these varieties and state all differences objectively;
(2) attach statistical data for characters expressed numerically and demonstrate that these are clear differences; and
(3) submit, if helpful, seed and plant specimens or photographs (prints) of seed and plant comparisons which clearly indicate distinctness.

19c. Exhibit C forms are available from the PVPO Office for most crops; specify crop kind. Fill in Exhibit C (Objective Description of Variety) form as completely as possible to describe your variety.

19d. Optional additional characteristics and/or photographs. Describe any additional characteristics that cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the characteristics that are difficult to describe, such as plant habit, plant color, disease resistance, *etc.*

19e. Section 52(5) of the Act requires applicants to furnish a statement of the basis of the applicant's ownership. An Exhibit E form is available from the PVPO.

20. If "Yes" is specified *(seed of this variety be sold by variety name only, as a class of certified seed)*, the applicant **MAY NOT** reverse this affirmative decision after the variety has been sold and so labeled, the decision published, or the certificate issued. However, if "No" has been specified, the applicant may change the choice. *(See Regulations and Rules of Practice, Section 97.103).*

23. *See Sections 41, 42, and 43 of the Act and Section 97.5 of the regulations for eligibility requirements.*

24. *See Section 55 of the Act for instructions on claiming the benefit of an earlier filing date.*

22. CONTINUED FROM FRONT *(Please provide a statement as to the limitation and sequence of generations that may be certified.)*

23. CONTINUED FROM FRONT *(Please provide the date of first sale, disposition, transfer, or use for each country and the circumstances, if the variety (including any harvested material) or a hybrid produced from this variety has been sold, disposed of, transferred, or used in the U.S. or other countries.)*

Seed of this variety was first offered for sale on January 17, 2004.

24. CONTINUED FROM FRONT *(Please give the country, date of filing or issuance, and assigned reference number, if the variety or any component of the variety is protected by intellectual property right (Plant Breeder's Right or Patent).)*

NOTES: It is the responsibility of the applicant/owner to keep the PVPO informed of any changes of address or change of ownership or assignment or owner's representative during the life of the application/certificate. The fees for filing a change of address; owner's representative; ownership or assignment; or any modification of owner's name is specified in Section 97.175 of the regulations. *(See Section 101 of the Act, and Sections 97.130, 97.131, 97.175(h) of the Regulations and Rules of Practice.)*

Exhibit A. Origin and Breeding History of the Variety

'Medark' rice (*Oryza sativa* L.)is a high-yielding, early-season, semi-dwarf medium-grain cultivar developed by the Arkansas Agricultural Experiment Station. Medark originated from the cross 'Bengal'/'Short Rico' (cross no.930254), made at the Rice Research and Extension Center, Stuttgart, AR, in 1993. Bengal released from Louisiana in 1993, is a early maturing, high yielding medium-grain rice cultivar. Short Rico, also medium grain rice, was designation RU9103069 in the 1991 Uniform Regional Rice Nursery. The experimental designation for early evaluation of Medark was STG97F5-05-084, starting with a bulk of F_6 seed from the 1996 panicle row P-06-069 when the line was uniform and stable. Medark was tested in the Arkansas Rice Performance Trials (ARPT) and the Cooperative Uniform Regional Rice Nursery (URRN) during 2000-2003 as entry RU0001151 (RU number indicated Cooperative Uniform Regional Rice Nursery; 00 indicates year entered; 01 indicates Stuttgart, AR; and 151 its initial entry number).

Year	Program Stage
2003	Foundation Seed Field- Uniform and Stable.
2000-2003	Arkansas Rice Performance Trials (4-6 loc) and URRN (4-5 loc) Uniform and Stable. Rough rice and milling yields, seedling vigor, height, maturity, straw strength, disease resistance, and straighthead resistance.
1999	Stuttgart Initial Test (2 locations)- Uniform and Stable. Preliminary information on rough rice and milling yields, seedling vigor, height, maturity, straw strength, disease resistance.
1998	Preliminary Yield Trial (1 location)- Uniform and Stable. preliminary data on rough rice and milling yields, height, maturity, straw strength, disease resistance.
1997	F_6 Panicle row (single row) STG97F5-05-084. Uniform and Stable- Selection based on plant and grain type. Bulked at this stage.
1996	F_5 Panicle row (single row) P-06-069- Single Panicle Decent/ Pedigree-Selection based on plant and grain type
1995-96 (winter)	F_4 Panicle row (single row) Puerto Rico- Winter Nursery
1995	F_3 Panicle row (single row)- panicle selection based on plant and grain type. Single Panicle Decent/Pedigree
1994	F_2 field - panicle selection based on plant type
1993-94	F_1 Greenhouse, Stuttgart,AR-Winter seed increase
1993	Crossing (930254)

Medark was developed involving a variety of plant breeding methods including pedigree, bulk, and single panicle decent.

Medark was uniform and stable in the F_6 generation and remained so through 5 generations of reproduction through and including foundation seed production.

Variants, less than .02% overall, that have been rogued from the foundation seed fields of Medark include the following: taller, shorter, earlier, later, glabrous, partly or totally pubescent plants. Leaves of variants may be broad or narrow. Grains are medium and medium-bold, partly awned with or without black apiculi, red coloration and /or parrot beaking. All of these variants are easily visually identified after heading in the field.

Exhibit B. Statement of Distinctness

Medark is most similar to the variety Bengal. Unlike Bengal, however, Medark has consistently better field resistance to blast disease, 2.1 and 4.9 vs.3.2 and 7.0 for leaf and neck blast, respectively(Table 1); and straighthead physiological disorder, 5.5 vs.7.5 (Table 2) all on a 0-9 scale with 0 immune and 9 maximum susceptibility.

Blast Disease caused by *Magnaporthe grisea*

Rice blast disease is rated visually on a 0-9 scale to estimate degree of severity. Numerical data is often converted to this scale. A rating of zero indicates complete disease immunity. A rating of one to three indicates resistance where little loss occurs and in the case of rice blast pathogen growth is restricted considerably. Conversely, a nine rating indicates maximum disease susceptibility, which typically results in complete plant death and/or yield loss. Depending upon the disease in question, a disease rating of four to six is usually indicative of acceptable disease resistance under conditions slightly favoring the pathogen. Numerical ratings are sometimes converted to letter symbols where 0-3 = R (resistant), 3-4 = MR (moderately resistant), 5-6 = MS (moderately susceptible) 7 = S (susceptible) and 8-9 VS (very susceptible). Exceptions to established ratings do occur unexpectedly as disease situations change.

These data come from several sources. It is not unusual for ratings to vary with location and year due to environmental differences and research procedures. Ratings within a source traditionally have been consistent.

Greenhouse blast tests are the primary means of screening large number of entries for varietal reaction to the many blast races occurring in the production areas. Although results are quite variable and testing conditions tends to overwhelm any field resistance present in the entry, this test provides an accurate definition of the fungus-variety genetics. Blast field nurseries, utilizing both natural and lab produced inoculum, are established in an effort to better define blast susceptibility under field conditions. Since field nursery is also quite variable, new techniques are currently being developed and evaluated to better estimate cultivar field resistance to blast.

Field nurseries are established and artificially inoculated with a mixture of commonly occurring *Magnaporthe grisea* isolates to provide a uniform disease pressure for evaluations under field conditions. Grower nurseries are established operate in an effort to evaluate disease reactions in grower fields under current production practices. Over time these nurseries document variety performance under adverse disease conditions in Arkansas production fields.

Table 1. Field *Magnaporthe grisea* (leaf and neck blast) ratings from three years of inoculated trials at Pine Tree Experiment Station, Arkansas for Medark and Bengal rice cultivars. (Average of 4 replications).

	2001		2002		2003		AVG	
	Leaf Blast	Neck Blast	Leaf Blast	Neck Blast	Leaf Blast	Neck Blast	Leaf Blast	Neck Blast
Medark	0.0	2.5	5.3	6.7	1.0	5.6	2.1	4.9
Bengal	1.6	5.1	6.3	8.0	1.7	8.0	3.2	7.0

Straighthead

Straighthead is a physiological disorder which appears to be effected by the oxygen potential of the soil. Under certain conditions, arsenic levels can increase in these soils or on soils where cotton has been grown and MSMA or other arsenical pesticides have been applied. Soil applied MSMA mimics natural straighthead symptoms and is used for screening. Straighthead may also occur in soils high in organic matter. Symptoms can only be detected after panicle emerge and fail to produce grain. Foliage tends to remain dark green. Rice grains may be distorted especially on long-grain varieties forming a parrot-beak on the end of the hull. Floral parts may also be missing and under sever conditions panicles fail to emerge from the boot.

Table 2. Straighthead ratings for 2 years of field evaluations for Medark and Bengal rice varieties. Stuttgart, AR.(Average of 3 replications).

STRAIGHTHEAD[1]	2002	2003	AVG
Medark	5	6	5.5
Bengal	7	8	7.5

[1] Based on a scale of 0 to 9 where 0 = no symptoms and
9 = no grain formation.
Rating Scale:

0 = no damage
1 = 81-90% grain develop
2 = 71-80% grain develop & 96-100% panicles broken from vertical
3 = 61-80% grain develop & 91-95% panicles broken from vertical
4 = 41-60% grain develop & 61-90% panicles broken from vertical
5 = 21-40% grain develop & 31-60% panicles broken from vertical - initial appearance of parrot-beak distortion
6 = 11-20% grain develop & 10-30% panicles broken from vertical
7 = panicles emerged but totally up right; only 0-10% grain develop
8 = 0-10% panicle emergence, no seed produced
9 = no panicles

[2] Avg. of 3 reps.

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MD 20705

Exhibit C

OBJECTIVE DESCRIPTION OF VARIETY
Rice (*Oryza sativa*)

NAME OF APPLICANT (S)	TEMPORARY OR EXPERIMENTAL DESIGNATION	VARIETY NAME
Arkansas Agriculture Experiment Station	RU0001151	Medark

ADDRESS *(Street and No. or RD No., City, State, and Zip Code, Country)*
Agricultural Food and Life Sciences Building
Room E108
University of Arkansas
Fayetteville Arkansas 72701

FOR OFFICIAL USE ONLY

PVPO NUMBER
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PLEASE READ ALL INSTRUCTIONS CAREFULLY:

Place the appropriate number that describes the character of this variety in the spaces provided below. These numbers are also code numbers corresponding to descriptors developed by IBGR-IRRI Rice Advisory Committee and the US Rice Crop Advisory Committee. Breeders will demonstrate distinctness more readily by describing as many characters as is possible.

1. MATURITY: Days to Heading (Seedling to 50% Heading)

A. South: (Location: Stuttgart AR) at 120 kg/ha (Nitrogen Rate)

88 Number of Days

1 Days Earlier Than Check Variety: Bengal

____ Days Same As Check Variety: Cocodrie

2 Days Later Than Check Variety: Jefferson

2 Maturity Class 1 = Very Early (85 Days or Less) 2 = Early (86 – 100) 3 = Intermediate (101 - 115) 4 = Late (More Than 115)

B. California: (Location: _____) at _____ kg/ha (Nitrogen Rate)

____ Number of Days

____ Days Earlier Than Check Variety: _____

____ Days Same As Check Variety: _____

____ Days Later Than Check Variety: _____

____ Maturity Class 1 = Very Early (90 Days or Less) 2 = Early (91 – 97) 3 = Intermediate (98 - 104) 4 = Late (More Than 104)

2. CULM:

1 Angle (Degrees from Perpendicular after Flowering):
1 = Erect (Less than 30°) 3 = Intermediate (About 45°) 5 = Open (About 60°)
7 = Spreading (More than 60° but the culms do not rest on the ground)
9 = Procumbent (The culm or its lower part rests on the ground surface)

2. CULM: (continued)

LENGTH

__9 6 • 5__ cm (Soil level to top of extended panicle on main stem)

__7 • 6__ cm Shorter Than Check Variety: Wells

Length Same as Check Variety: Bengal

__ __ • __ cm Longer than Check Variety: _____

__1__ Height Class: 1 = Semidwarf 2 = Short 3 = Medium 4 = Tall

__1__ Internode Color: (After Flowering): 1 = Green 2 = Light Gold 3 = Purple Lines 4 = Purple

__1__ Strength (Lodging Resistance): 1 = Strong (no Lodging) 3 = Moderately Strong (Most Plants Leaning) 5 = Intermediate (Most Plants Lodged) 7 = Weak (Most Plants Flat) 9 = Very Weak (All Plants Flat)

3. FLAG LEAF: (After Heading)

__3 2 • 8__ cm Length __1 6 • 6__ mm Width

__1__ Pubescence: 1 = Glabrous 2 = Intermediate 3 -= Pubescent

__1__ Leaf Angle (After Heading): 1 = Erect 3 = Intermediate 5 = Horizontal 7 = Descending

__2__ Blade Color: 1 = Pale Green 2 = Green 3 = Dark Green 4 = Purple Tips 5 = Purple Margins 6 = Purple Blotch 7 = Purple

__1__ Basal Leaf Sheath Color: 1 = Green 2 = Purple Lines 3 = Light Purple 4 = Purple

4. LIGULE:

__7 • 7__ mm Length (From base of collar to the tip, at late vegetative stage)

__1__ Color: (Late Vegetative Stage): 1 = White 2 = Purple Lines 3 = Purple

__2__ Shape: 1 = Acute to Acuminate 2 = 2-Cleft 3 = Truncate

__1__ Collar Color (Late Vegetative Stage): 1 = Pale Green 2 = Green 3 = Purple

__1__ Auricle Color (Late Vegetative Stage): 1 = Pale Green 2 = Purple

5. PANICLE:

__2 2 • 6__ cm Length

__5__ Type: 1 = Compact 5 = Intermediate 9 = Open

__2__ Secondary Branching: 1 = Absent 2 = Light 3 = Heavy 4 = Clustering

__3__ Exsertion (Near Maturity): 1 = Less than 90% 2 = 90 – 99% 3 = 100% Exserted

__2__ Axis: 1 = Straight 2 = Droopy

__3__ Shattering: 1 = Very Low (Less Than 1%) 3 = Low (1 – 5%) 5 = Moderate (6 – 25%) 7 = Moderately High (26 – 50%) 9 = High (More than 50%)

__2__ Threshability: 1 = Difficult 2 = Intermediate 3 = Easy

6. GRAIN: (Spikelet)

__0__ Awns (After Full Heading): 0 = Absent 1 = Short and Partly Awned 5 = Short and Fully Awned 7 = Long and Partly Awned 9 = Long and Fully Awned

__2__ Apiculus Color (At Maturity) 1 = White 2 = Straw 3 = Brown (Tawny) 4 = Red 5 = Red Apex 6 = Purple 7 = Purple Apex

__1__ Stigma Color: 1 = White 2 = Light Green 3 = Yellow 4 = Light Purple 5 = Purple

6. GRAIN: (Spikelet)

4 Lemma and Palea Color (At Maturity):

0 = Straw; 1 = Gold and/or Gold Furrows on Straw Background; 2 = Brown Spots on Straw (Piebald)
3 = Brown Furrows on Straw; 4 = Brown (Tawny); 5 = Reddish to Light Purple
6 = Purple Spots on Straw; 7 = Purple Furrows on Straw; 8 = Purple
9 = Black; 10 = White

1 Lemma and Palea Pubescence: 1 = Glabrous; 2 = Hairs on Lemma Keel; 3 = Hairs on Upper Portion; 4 = Short Hairs; 5 = Long Hairs (Velvety)

1 Spikelet Sterility (At Maturity): 1 = Highly Fertile (> 90%); 3 = Fertile (75 – 90%); 5 = Partly Sterile (50 – 74%); 7 = Highly Sterile (< 50% to Trace); 9 = Completely Sterile (0%)

7. GRAIN: (Seed)

2 Seed Coat (Bran) Color: 1 = White; 2 = Light Brown; 3 = Speckled Brown; 4 = Brown; 5 = Red; 6 = Variable Purple; 7 = Purple

1 Endosperm Type: 1 = Nonglutinous (Nonwaxy); 2 = Glutinous (Waxy); 3 = Indeterminate

1 Endosperm Translucency: 1 = Clear; 5 = Intermediate; 9 = Opaque

1 Endosperm Chalkiness: 0 = None; 1 = Small (Less than 10% of Sample); 5 = Medium (10 – 20% of Sample); 9 = Large (More than 20% of Sample)

0 Scent (Aroma): 0 = Nonscented; 1 = Lightly Scented; 2 = Scented

Shape Class (Length/Width Ratio):

2 Paddy: 1 = Short (2.2:1 and Less); 2 = Medium (2.3:1 to 3.3:1); 3 = Long (3.4:1 and More)

2 Brown: 1 = Short (2.0:1 and Less); 2 = Medium (2.1:1 to 3.0:1); 3 = Long (3.1:1 and More)

2 Milled: 1 = Short (1.9:1 and Less); 2 = Medium (2.0:1 to 2.9:1); 3 = Long (3.0:1 and More)

Measurements: Grain Form	Length (mm)	Width (mm)	Thickness (mm)	L/W Ratio	1000 Grains (grams)
Paddy	8.37	3.32	1.88	2.52	28.50
Brown	6.24	2.83	1.81	2.20	23.57
Milled	5.88	2.85	1.80	2.06	22.02

29 Milling Quality (% Hulls) 60 Milling Yield (% While Kernel (head) Rice to Rough Rice)

ND % Protien 14.2 % Amylose

Alkali Spreading Value: ND 1.5% KOH Solution 6 1.7% KOH Solution

7 Gelatination Temperature Type: 1 = High; 5 = Intermediate; 7 = Low

Amylographic Paste Viscosity (Brabender Units) RVA= Rapid Viscoanalyzer

Peak	Hot Paste	Cooled Paste	"Breakdown"	"Setback"
241	149	243	91	3

8. RESISTANCE TO LOW TEMPERTURE:

2 Germination and Seedling Vigor: 1 = Low; 2 = Medium; 3 = High

ND Flowering (Spikelet Fertility): 1 = Low; 2 = Medium; 3 = High

9. SEEDLING VIGOR NOT RELATED TO LOW TEMPERATURE:

3 Vigor: 1 = Low; 2 = Medium; 3 = High

10. BLAST RESISTANCE: (*Pyicularia oryzae*). (International races found under References)

0 = Immune 1 = Resistant 3 = Moderately Resistant 5 = Intermediate 7 = Moderately Susceptible 9 = Susceptible

Group	IB				IC		ID		IE	IG	IH	IE-1K
Number	1	~~3~~-33	45	49	54	1	17	1	13	1	1	1	
Resistance	6.0	6.5	ND	8.0	0.0	ND	4.0	ND	ND	ND	4.8	3.0	4.0

11. RESISTANCE TO OTHER DISEASES:

0 = Immune 1 = Resistant 3 = Moderately Resistant 5 = Intermediate 7 = Moderately Susceptible 9 = Susceptible

ND Narrow Brown Leaf Spot (*Cerospora oryzae*)

ND Leaf Smut (*Entyloma oryzae*)

3 Brown Leaf Spot (*Helminthosporium oryzae*) (=*Bipolaris oryzae*) (=*Drechslera oryzae*)

ND Leaf Scald (*Gerlachia oryzae*)

ND Hoja Blanca Virus

3 Sheath Rot (*Sarocladium oryzae*)

ND Pythium Seedling Blight (*Pythium* sp.)

ND Sheath Spot (*Rhizoctonia oryzae*)

____ Other: _____

ND Aggregate Sheath Spot (*Rhizoctonia oryzae-sativae*)

5 Straight Head

5 Kernel Smut (*Neovossia horrida*) (=*Tilletia barclayana*)

ND White Tip Nematode (*Aphelenchoides besseyi*)

7 Stem Rot (*Sclerotium oryzae*)

ND Bacterial Blight (*Xanthomonas campestris pv. oryzae*)

7 Sheath Blight (*Rhizoctonia solani*)

12. INSECT RESISTANCE:

0 = Immune 1 = Resistant 3 = Moderately Resistant 5 = Intermediate 7 = Moderately Susceptible 9 = Susceptible

ND Grasshopper

ND Rice Leafhopper

ND Rice Hispa

ND Rice Midge

ND Least Skipper

7 Rice Stink Bug (*Oegalus pugnax*)

ND Swarm Caterpillar

5 Rice Water Weevil (*Lissorhoptrus oryzophilus*)

ND Rice Stalk Borer (*Chilo plejadellus*)

ND Sugarcane Borer (*Diatraea saccharalis*)

13. OTHER DESCRIPTORS: If there are other characters that describe this variety, please indicate below:

Medark has average field leaf blast rating of 2.1 and neck blast rating of 4.9 on scale of 0 to 9.

REFERENCES

C. R. Adair *et al.* 1972. Rice in the United States: Varieties and Production. USDA Handbook No. 289 (Rev.), 124 pp.

J. G. Atkins *et al.* 1967. An International Set of Rice Varieties for Differentiating Race of *Pyricularia Oryzae*. Phytopath. 57:297-301.

IBPGR-IRRI Rice Advisory Committee. 1980. Descriptors for Rice *Oryzae Sativa* L. International Rice Research Institute. 21 pp.

K. C. Ling and S. H. Ou, 1969. Standardization of the International Race Numbers of *Pyricularia Oryzae*. Phytopath. 59:339-342.

B. D. Webb *et al.* 1985. Utilization Characteristics and Qualities of United States Rice. In Proceedings on Rice Grain Quality and Marketing. International Rice Research Institute (IRRI), Los Branos, Philippines. P. 25-35.

Exhibit D. Additional description of the Variety

Rough Rice and Milling Yield: Averaged over 20 Arkansas Rice Performance Trials (ARPT), rough rice grain yields of Medark, Bengal, 'Wells', 'Francis', 'Kaybonnet', 'Drew', 'Cocodrie', and 'Cypress' were 8946, 9300, 9654, 9856, 8289, 8592, 8794, and 8137, kg ha^{-1} (120 g kg^{-1} (12%) moisture), respectively. Data from the URRN conducted at Arkansas, Louisiana, Mississippi, and Texas during 2000 - 2002 showed Medark average grain yield of 9198 kg ha^{-1} compared with those of Bengal, Wells, Francis, 'Saber', Drew, Cocodrie, and Cypress at 9603, 10260, 10715, 8643, 8997, 9603, and 8491 kg ha^{-1}, respectively. Milling yields (mg g^{-1} whole kernel:mg g^{-1} total milled rice) at 120 mg g^{-1} moisture from the ARPT, 2000-2003, averaged 660:710, 680:720, 640:730, 650:720, 660:720, 660:720, 670:720, and 680:720 for Medark, Bengal, Wells, Francis, Kaybonnet, Drew, Cocodrie, and Cypress, respectively. Milling yields for the URRN during 2000 - 2002, averaged 600:700, 620:700, 570:670, 560:700, 610:680, 600:690, 600:690, and 620:690 for Medark, Bengal, Ahrent, Wells, Saber, Drew, Cocodrie, and Cypress, respectively. Medark yields slightly less, from 405 to 354 kg ha^{-1}, and results in milling yields slightly less, from 20:00 to 20:10, than Bengal.

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U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

Application is required in order to determine if a plant variety protection certificate is to be issued *(7 U.S.C. 2421)*. The information is held confidential until the certificate is issued *(7 U.S.C. 2426)*.

1. NAME OF APPLICANT(S)	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER	3. VARIETY NAME
Arkansas Agricultural Experiment Station	RU0001151	Medark
4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP, and Country)*	**5. TELEPHONE** *(Include area code)*	**6. FAX** *(Include area code)*
Agricultural Food and Life Sciences Building Room E108 Unversity of Arkansas Fayetteville AR 72701	(479) 575-6884	(479) 575-8646
	7. PVPO NUMBER 200500055	

8. Does the applicant own all rights to the variety? Mark an "X" in the appropriate block. **If no, please explain.** ☑ **YES** ☐ **NO**

9. Is the applicant (individual or company) a U.S. national or a U.S. based company? **If no, give name of country.** ☑ **YES** ☐ **NO**

10. Is the applicant the original owner? ☑ **YES** ☐ **NO** **If no, please answer <u>one</u> of the following:**

a. If the original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. National(s)?
☐ **YES** ☐ **NO** **If no, give name of country**

b. If the original rights to variety were owned by a company(ies), is (are) the original owner(s) a U.S. based company?
☐ **YES** ☐ **NO** **If no, give name of country**

11. Additional explanation on ownership *(Trace ownership from original breeder to current owner. Use the reverse for extra space if needed)*:

PLEASE NOTE:

Plant variety protection can only be afforded to the owners (not licensees) who meet the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.

2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.

3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed the final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definitions.